

WHAT IS CLAIMED IS:

1. A method of forming a semiconductor device,
comprising:

forming at least one amorphous region within an at
5 least partially formed semiconductor device;

implanting a halogen species in the at least one
amorphous region of the at least partially formed
semiconductor device;

doping at least a portion of the at least one
10 amorphous region to form at least one junction within the
at least partially formed semiconductor device; and

activating the doped portion of the at least one
amorphous region of the at least partially formed
semiconductor device by solid phase epitaxial re-growth.

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2. The method of Claim 1, wherein forming the
amorphous region comprises implanting a species selected
from the group consisting of silicon and germanium.

20 3. The method of Claim 1, wherein the halogen
species comprises a species selected from the group
consisting of fluorine and chlorine.

4. The method of Claim 1, wherein the halogen
25 species is implanted after forming the amorphous region.

5. The method of Claim 1, wherein the halogen
species is implanted substantially simultaneously with
forming the at least one amorphous region.

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6. The method of Claim 1, wherein the at least one
junction comprises a region selected from the group
consisting of a drain region, a source region, and an
extension region.

7. The method of Claim 1, wherein the at least one junction is doped with a dopant selected from the group consisting of boron, phosphorous, and arsenic.

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8. The method of Claim 1, wherein an amorphous depth (X_a) associated with the at least one amorphous region is greater than or equal to a junction depth (X_j) associated with the at least one junction.

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9. The method of Claim 1, wherein an amorphous depth (X_a) associated with the at least one amorphous region is less than or equal to a junction depth (X_j) associated with the at least one junction.

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10. A method of forming a semiconductor device,
comprising:

implanting at least a halogen species within an at
least partially formed semiconductor device to form at
5 least one amorphous region;

doping at least a portion of the at least one
amorphous region to form at least one junction within the
at least partially formed semiconductor device; and

activating the doped portion of the at least one
10 amorphous region of the at least partially formed
semiconductor device by solid phase epitaxial re-growth.

11. The method of Claim 10, wherein the at least
one amorphous region is implanted with the at least a
15 halogen species and at least a germanium species.

12. The method of Claim 10, wherein the at least a
halogen species comprises fluorine.

20 13. The method of Claim 10, wherein the at least
one junction is doped with at least a boron dopant.

14. The method of Claim 10, wherein an amorphous
depth (X_a) associated with the at least one amorphous
25 region is greater than or equal to a junction depth (X_j)
associated with the at least one junction.

15. The method of Claim 10, wherein an amorphous
depth (X_a) associated with the at least one amorphous
30 region is less than or equal to a junction depth (X_j)
associated with the at least one junction.

16. A transistor formed using a method, comprising:
implanting at least a halogen species within an at
least partially formed semiconductor device to form at
least one amorphous region;
- 5 doping at least a portion of the at least one
amorphous region to form at least one junction within the
at least partially formed semiconductor device; and
activating the doped portion of the at least one
amorphous region of the at least partially formed
10 semiconductor device by solid phase epitaxial re-growth.
17. The transistor of Claim 16, wherein the at
least a halogen species comprises fluorine.
- 15 18. The transistor of Claim 16, wherein the at
least one junction is doped with at least a boron dopant.
19. The transistor of Claim 16, wherein an
amorphous depth (X_a) associated with the at least one
20 amorphous region is greater than or equal to a junction
depth (X_j) associated with the at least one junction.
20. The transistor of Claim 16, wherein an
amorphous depth (X_a) associated with the at least one
25 amorphous region is less than or equal to a junction
depth (X_j) associated with the at least one junction.